

Technical Appendices

Appendix D - Air Quality

Illingworth and Rodkin, Inc. Cochrane Road Retail Development Air
Quality Assessment, Morgan Hill, California. March 15, 2005.

***COCHRANE ROAD RETAIL DEVELOPMENT
AIR QUALITY ASSESSMENT
MORGAN HILL, CALIFORNIA***

March 15, 2005

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INTRODUCTION

This section examines the degree to which the proposed project may result in significant adverse changes to air quality. Both short-term construction emissions occurring from activities such as site grading, as well as long-term effects related to the ongoing operation of the proposed project are discussed. The analysis contained herein focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emissions" refers to the actual quantity of pollutant, measured in pounds per day. "Concentrations" refers to the amount of pollutant material per volumetric unit of air. Concentrations are measured in parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

OVERALL REGULATORY SETTING

The Federal Clean Air Act governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the Federal level, the United States Environmental Protection Agency (USEPA) administers the Clean Air Act (CAA). The California Clean Air Act is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes the nine-county Bay Area.

United States Environmental Protection Agency

The USEPA is responsible for enforcing the Federal CAA. The USEPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 CAA and subsequent amendments. The USEPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The agency has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

California Air Resources Board

In California, the CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for meeting the state requirements of the Federal CAA, administering the California CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the California Ambient Air Quality Standards (CAAQS). The CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. The CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective on March 1996. The CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Bay Area Air Quality Management District

In 1955, the California Legislature created the Bay Area Air Quality Management District (BAAQMD). The agency is primarily responsible for assuring that the National and State ambient air quality standards are attained and maintained in the Bay Area. The BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities. The BAAQMD has jurisdiction over much of the nine-county Bay Area counties.

National and State Ambient Air Quality Standards

As required by the Federal Clean Air Act, the NAAQS have been established for six major air pollutants: carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O₃), respirable particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), sulfur oxides, and lead. Pursuant to the California Clean Air Act, the State of California has also established ambient air quality standards, known as the California Ambient Air Quality Standards (CAAQS). These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles.

Both State and Federal standards are summarized in [Table 1](#). The “primary” standards have been established to protect the public health. The “secondary” standards are intended to protect the nation’s welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare. The use of the NAAQS or CAAQS is a function of the project approval process. The NAAQS is applicable if the project is federally funded or requires federal action. The proposed project is not federally funded and does not require federal action. Additionally, the CAAQS are more stringent than the NAAQS. Thus, the CAAQS are used as the comparative standard in the analysis contained in this report.

Criteria Air Pollutants & Effect

Air quality studies generally focus on five pollutants that are most commonly measured and regulated: CO, O₃, NO₂, SO₂, and suspended particulate, i.e., PM₁₀ and PM_{2.5}.

Carbon Monoxide. CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhausts release approximately 70 percent of the CO in the Bay Area. A substantial amount also comes from burning wood in fireplaces and wood stoves. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. The highest CO concentrations measured in the Bay Area are typically recorded during the winter.

Ozone. O₃, a colorless toxic gas, is the chief component of urban smog. O₃ enters the blood stream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. Although O₃ is not directly emitted, it forms in the atmosphere through a

chemical reaction between reactive organic gas (ROG) and nitrogen oxides (NO_x) under sunlight.¹ ROG and NO_x are primarily emitted from automobiles and industrial sources. O₃ is present in relatively high concentrations within the Bay Area, and the damaging effects of photochemical smog are generally related to the concentration of O₃. Highest O₃ concentrations occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies.

Nitrogen Dioxide. NO₂, a reddish-brown gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O₃, NO₂ is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO₂ are collectively referred to as nitrogen oxides (NO_x) and are major contributors to O₃ formation. NO₂ also contributes to the formation of PM₁₀ (see discussion of PM₁₀ below).

Sulfur Oxides. Sulfur oxides, primarily SO₂, are a product of high-sulfur fuel combustion. The main sources of SO₂ are coal and oil used in power stations, in industries, and for domestic heating. SO₂ is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO₂ concentrations have been reduced to levels well below the state and national standards, but further reductions in emissions are needed to attain compliance with standards for PM₁₀, of which SO₂ is a contributor.

Suspended Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gaseous pollutant undergo chemical reactions in the atmosphere. Respirable particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}) represent fractions of particulate matter. PM₁₀ refers to particulate matter less than 10 microns in diameter and PM_{2.5} refers to particulate matter that is 2.5 microns or less in diameter. Major sources of PM₁₀ include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning, industrial sources, windblown dust from open lands, and atmospheric chemical and photochemical reactions. PM_{2.5} results primarily from diesel fuel combustion (from motor vehicles, power generation, industrial facilities), residential fireplaces, and wood stoves. PM₁₀ and PM_{2.5} pose a greater health risk than larger-size particles, because these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract increasing the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Whereas, larger particles tend to collect in the upper portion of the respiratory system, PM_{2.5} are so tiny that they can penetrate deeper into the lungs and damage lung tissues.² Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

Toxic Air Contaminants (TAC)

TACs are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above.

¹ ROG and NO_x are emitted from automobiles and industrial sources.

² The NAAQS for PM_{2.5} was adopted in 1997. Presently no methodologies for determining impacts relating to PM_{2.5} have been developed or adopted by federal, state, or regional agencies. The State standard for PM₁₀ is more stringent than the Federal PM_{2.5} standard.

TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., benzene near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the CARB, diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the ARB, and are listed as carcinogens either under the state's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The U.S. EPA has adopted low sulfur diesel fuel standards that will reduce diesel particulate matter substantially. These go into effect in June 2006.

In cooler weather, smoke from residential wood combustion can be a source of TACs. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind, the pollution can persist for many hours. This occurs in sheltered valleys during the winter. Woodsmoke also contains a significant amount of PM₁₀ and PM_{2.5}. Woodsmoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

Bay Area Clean Air Plan

The BAAQMD along with the other regional agencies (i.e., Association of Bay Area Governments and the Metropolitan Transportation Commission) has prepared an Ozone Attainment Plan to address the NAAQS for O₃. A Carbon Monoxide Maintenance Plan was also prepared in 1994 to demonstrate how the NAAQS for carbon monoxide standard will be maintained. Another plan, the Bay Area Clean Air Plan, was prepared to address the more stringent requirements of the California Clean Air Act with respect to O₃. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter state air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of O₃ precursor pollutants through the expeditious implementation of all feasible measures. Air quality plans addressing the California Clean Air Act are developed about every three years. The latest plan (Bay Area 2000 Clean Air Plan) was prepared in 2000. The plan proposes implementation of transportation control measures (TCMs) and programs such as *Spare the Air*. *Spare the Air* is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation. The 2001 Ozone Plan included the strategy to attain the national ambient air quality standard for O₃. In 2004, U.S. EPA made a finding that the Bay Area has attained the national 1-hour ozone standard. Because of this finding, the previous planning commitments in the 2001 Ozone Attainment Plan are no longer required. The finding of attainment does not mean the Bay Area has been reclassified as an attainment area for the 1-hour standard. The region must submit a redesignation request to EPA in order to be reclassified as an attainment area. To address both the national and California ambient air quality standards, the BAAQMD is preparing an updated ozone strategy. In 2004, the BAAQMD held community meetings throughout the Bay Area to

describe the draft control measures proposed for the Ozone Strategy and to invite public input. The draft Ozone Strategy, including proposed control measures, will be released for public review in 2005.

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. Most important is vehicle activity. The BAAQMD uses population projections made by the Association of Bay Area Governments and vehicle use trends made by the Metropolitan Transportation Commission to formulate future air pollutant emission inventories. The basis for these projections comes from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When General Plans are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region.

SETTING

Climate and Topography

The climate is mainly characterized by warm dry summers with abundant sunshine and cool moist winters with variable cloudiness. The proximity of the Pacific Ocean and San Francisco Bay has a moderating influence on the climate. Morgan Hill lies in the southern portion of the Santa Clara Valley, which is generally oriented from the northwest to the southeast. This valley is bounded to the north by the San Francisco Bay, and by mountains to the east, south, and west. The surrounding terrain greatly influences winds in the valley, resulting in a prevailing wind that follows along the valley's northwest-southeast axis. During the afternoon and early evening, a north-northwesterly sea breeze often flows through the valley, and a light south-southeasterly drainage flow often occurs during the late evening and early morning hours.

Typical summer maximum temperatures for the region are in the 80's, while winter maximum temperatures are in the high 50's or low 60's. Minimum temperatures usually range from the high 50's in the summer to the upper 30's and low 40's in the winter. Rainfall in the valley is approximately 20 to 25 inches per year, occurring mostly in the months of November through March.

Air quality standards for ozone traditionally are exceeded when relatively stagnant conditions occur for periods of several days during the warmer months of the year. Weak wind flow patterns combined with strong inversions substantially reduces normal atmospheric mixing. Key components of ground-level ozone formation are sunlight and heat; therefore, significant ozone formation only occurs during the months from late spring through early fall. Prevailing winds during the summer and fall can transport and trap ozone precursors from the more urbanized portions of the Bay Area. Meteorological factors make air pollution potential in the southern Santa Clara Valley quite high. The clear skies with relatively warm conditions that are typical in summer combine with transported and localized air pollutant emissions to elevate ozone levels. The surrounding mountains up slope and downslope flows may also recirculate pollutants already present, contributing to the buildup of air pollution. Light winds and stable conditions during the late fall and winter contribute to the buildup of particulate matter from motor vehicles, agriculture, and wood burning in fireplaces and stoves.

Air Monitoring Data

Air quality in the region is controlled by the rate of pollutant emissions and meteorological conditions. Meteorological conditions such as wind speed, atmospheric stability, and mixing height may all affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while frequent, short-term variations result from changes in atmospheric conditions. The San Francisco Bay Area is considered to be one of the cleanest metropolitan areas in the country with respect to air quality. The BAAQMD monitors air quality conditions at over 30 locations throughout the Bay Area. There are no air pollutant monitoring stations in Morgan Hill; the BAAQMD monitoring stations closest to Morgan Hill are in San Martin and San Jose. Air pollutant concentrations measured at these stations closest are shown below in Table 2.

The pollutant of most concern in the Morgan Hill area is ozone, since prevailing summertime wind conditions tend to cause a build up of ozone in the southern Santa Clara Valley. Ozone levels measured in San Martin, which is close to Morgan Hill, exceeded the state ozone standard from 4 to 8 times in 2000-2003; however, there were no exceedances in 2004. The federal 1-hour ozone standard has not been exceeded in the last five years at San Martin, but the 8-hour standard was exceeded from 1 to 5 days for 2000-2003 and no exceedances in 2004. PM₁₀ levels measured in San Jose are probably higher than those that would be measured in Morgan Hill due to the urban nature around the monitoring station. Measured exceedances of the state PM₁₀ standard have occurred between 2 and 4 times each year in San Jose. Exceedances of the federal PM_{2.5} standard were not measured in San Jose. In the more rural areas near Morgan Hill where PM₁₀ is monitored, such as Watsonville and Hollister, there were no measured exceedances of the federal or state PM₁₀ standard. The entire Bay Area, including Morgan Hill, did not experience any exceedances of other air pollutants. Table 3 reports the number of days that an ambient air quality standard was exceeded at any of the stations near Morgan Hill and in the entire Bay Area.

Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The Bay Area as a whole does not meet State or Federal ambient air quality standards for ground level O₃ and State standards for fine particulate matter.

Under the Federal CAA, the US EPA has designated the region as *moderate non-attainment* for ground level O₃. However, the US EPA has recognized that the region has not violated the 1-hour O₃ standard over the last three years (2000-2003) and has proposed to redesignate the Bay Area as a maintenance area. This is the first step towards designating the Bay Area as attainment of that standard. However, US EPA has recently classified the region as marginally nonattainment for the newer more stringent 8-hour O₃ standard. EPA requires the region to adopt a plan that will bring it into attainment with that standard by 2007. The Bay Area has met the CO standards for over a decade and is classified *attainment maintenance* by the US EPA. The US EPA grades the region *unclassified* for all other air pollutants, which include PM₁₀ and PM_{2.5}.

At the State level, the region is considered *serious non-attainment* for ground level O₃ and non-attainment for PM₁₀. California ambient air quality standards are more stringent than the national ambient air quality standards. The region is required to adopt plans on a triennial basis that show progress towards meeting the State O₃ standard. The area is considered attainment or unclassified for all other pollutants.

Sensitive Receptors

Some groups of people are more affected by air pollution than others. CARB has identified the following people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks.

ENVIRONMENTAL IMPACTS AND MITIGATION

Thresholds of Significance

The CEQA Guidelines (Section 15064.7) provide that, when available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make determinations of significance. The following are the significance criteria that the BAAQMD has established to determine project impacts:

Construction

The BAAQMD's approach to the CEQA analysis of construction impacts is to emphasize the implementation of effective and comprehensive control measures rather than detailed quantification of emissions. PM₁₀ is the pollutant of greatest concern from construction activities.³ The BAAQMD CEQA Guidelines provide feasible control measures for construction emissions of PM₁₀. If the appropriate construction controls are implemented, air pollutant emissions for construction activities would be considered less than significant.

Operations

Plan build out would cause a significant air quality impact if it were to result in:

- Ozone precursor emissions (ROG and NO_x) and PM₁₀ emissions from direct and indirect sources (non typical construction) that exceed the thresholds recommended by the BAAQMD. The BAAQMD recommends a threshold of 80 pounds per day or 15 tons per year for direct and indirect sources of ROG, NO_x, and PM₁₀.
- Emissions of carbon monoxide cause a projected exceedance of the ambient carbon monoxide state standard of 9.0 ppm for 8-hour averaging period.

³ Construction equipment emits ozone precursors. However, these emissions are included in the emission inventory, which are the basis for the regional air quality plan and are not expected to impede attainment of ozone in the Bay Area.

Cumulative Impacts

Build out of the project would result in a significant cumulative air quality impact if project impacts are significant as listed above or the project is found to be inconsistent with the applicable General Plan and/or the BAAQMD Clean Air Plan.

ENVIRONMENTAL IMPACTS

Project Impacts

Impact 1: Construction Impacts. Construction activity during build out of the project would generate air pollutant emissions that could expose sensitive receptors to substantial pollutant concentrations. This is a potentially significant impact.

Build out of the shopping center would involve construction over several years. This construction period would likely include an initial grading of the site and then many small and medium size construction projects that could result in different air quality impacts based on their size, duration and proximity to sensitive receptors. Construction activities would generate pollutant emissions from the following construction activities: grading, construction worker travel to and from project sites, delivery and hauling of construction supplies and debris to and from the project site, and fuel combustion by on-site construction equipment. These construction activities would temporarily create emissions of dusts, fumes, equipment exhaust, and other air contaminants. PM₁₀ is typically the most significant source of air pollution from construction, particularly during site preparation and grading. PM₁₀ emissions from construction can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, the equipment being operated, weather conditions, and soil conditions. Typically, the BAAQMD does not require quantitative analysis for construction. Rather the analysis is focused on identifying the most appropriate control measures. The BAAQMD has identified a set of feasible PM₁₀ control measures for construction activities. These measures are listed at the end of this section under "Construction Phase Mitigation Measures." According to the BAAQMD CEQA Guidelines, if all of these control measures are implemented, a less than significant impact is expected for PM₁₀ emissions.

Construction Phase Mitigation Measures

The following is a list of feasible control measures that the BAAQMD recommends for construction emissions of PM₁₀. These mitigation measures shall be implemented for all areas (both on-site and off-site) where construction activities would occur.

1. Sprinkle water to all active construction areas at least twice daily and more often when conditions warrant.
2. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.
3. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
4. Sweep daily all paved access roads, parking areas, and staging areas at construction sites.
5. Sweep streets daily if visible soil material is carried onto adjacent public streets.

6. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas.
7. Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).
8. Limit traffic speeds on unpaved roads to 15 miles per hour.
9. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
10. Replant vegetation in disturbed areas as quickly as possible.
11. Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
12. Suspend grading activities when winds exceed 25 miles per hour (mph) and visible dust clouds cannot be prevented from extending beyond active construction areas.
13. Limit the area subject to excavation, grading and other construction activity at any one time.

Impact 2: Operational Emissions. The project would generate new emissions that would affect long-term air quality. This would be a significant impact.

The proposed shopping center would produce new automobile trips, generating emissions of criteria air pollutants, which could affect both regional and local air quality. The traffic study predicts an addition of about 22,000 daily weekday automobile trips at the time of full build out. All predicted traffic increases were assumed to be attributed to the plan build out conditions. Future changes to air quality were predicted using computer models. Project-related emissions were calculated using the latest available version of the URBEMIS model while predicted CO concentrations were modeled using screening methodologies based on the Caline4 model. The methodologies used for these analyses along with modeling output are contained in Appendix X.

Local Carbon Monoxide Impacts

Carbon monoxide emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Intersections along Cochrane Road would be most affected by the project. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of carbon monoxide. Carbon monoxide concentrations were predicted for intersections along Cochrane Road. There are 1- and 8-hour standards for carbon monoxide. The 8-hour standard is the most stringent and is always exceeded if the 1-hour standard is exceeded. Therefore, this analysis evaluated impacts against the 8-hour standard.

Carbon monoxide concentrations were modeled using screening methods recommended by the BAAQMD that are based on the Caline4 Line-Source dispersion model. This method uses traffic volumes, emissions, meteorology, and the roadway/receptor geometry. For this assessment, meteorological conditions most conducive for high carbon monoxide concentrations in the Bay Area, peak-hour traffic conditions (i.e., evening period), slow traffic speeds and emission factors generated by the California Air Resources Board emission factor model (i.e., EMFAC2002) were used as input to the model. Modeled concentrations were added to background levels to predict total carbon monoxide concentrations. This assessment was conducted for existing conditions (2004) and project conditions in (about 2007), and with cumulative build out that would occur beyond 2010. The screening method is designed to be a conservative method of determining whether or not a project may cause exceedances of the carbon monoxide air quality standard. If the screening method predicts significant levels, than a

more-refined analysis may be conducted that would more accurately predict carbon monoxide levels, which would likely be lower. Results of this assessment are shown in Table 4.

As shown in Table 4, the screening analysis indicates that modeled existing 8-hour Carbon Monoxide concentrations are currently below California Ambient Air Quality Standards. Predicted 8-hour Carbon monoxide concentrations with the project are predicted to remain below California ambient air quality standards. Although traffic will increase under cumulative conditions, carbon monoxide concentrations are anticipated to decrease because of cleaner less-polluting vehicles using the roadways. This impact on local air quality resulting from the project is considered to be less-than-significant.

Regional Air Quality Impacts

Emissions of ozone precursor pollutants (i.e., reactive organic gases [ROG] and nitrogen oxides [NO_x]) and small particulate matter (i.e., PM₁₀) can affect air quality throughout the Bay Area. It is virtually impossible to predict the affect of emissions from the project to levels of ozone and PM₁₀ in the region. However, the significance of project air pollutant emissions are evaluated against emission significance thresholds established by the BAAQMD.

To evaluate the project effects on regional air quality, emissions of ozone precursor pollutants and PM₁₀ were predicted. The URBEMIS2002 Model, obtained from the California Air Resources Board, was used to predict air pollutant emissions associated with project-related automobile use. This model combines assumptions for automobile activity (e.g., number of trips, vehicle mix, vehicle miles traveled, etc.) with vehicle emission factors. Project trip generation data provided by the Traffic Engineer (i.e., Fehr and Peers) were used as input to the model. Potential emissions of ROG from a possible gas station were predicted and are added to the URBEMIS2002 modeling results. Daily emissions of regional air pollutants from build out of the proposed shopping center are shown in Table 5. Project direct and indirect emissions of ozone precursor pollutants (i.e., ROG and NO_x) would exceed the thresholds established by the BAAQMD. PM₁₀ emissions, which could lead to both regional and local air quality impacts, would also exceed the significance thresholds. Because the project generates more traffic on weekend days (i.e., Saturdays), emissions would be higher. In fact, emissions of ozone precursor pollutants and PM₁₀, which are significant on weekdays, would be over 30 percent higher on peak Saturdays. Emissions of ozone precursor pollutants that exceed the significance thresholds would impact the regions' effort to attain and maintain the ozone ambient air quality standards. The project's emissions of PM₁₀, which also exceed the thresholds, may cumulatively contribute to violations of the Sate standard. These emissions are predicted to be above the significance thresholds established by the BAAQMD, and therefore, would be considered significant.

Operational Phase Mitigation

This adverse impact can be reduced, but not fully mitigated through implementation of this mitigation measure. The project applicant shall implement a facilities trip reduction plan. Elements of this plan that would reduce traffic (mostly project worker trips), and thus air pollutant emissions, are listed below.

- Provide bus pullouts and transit stops at several locations with pedestrian access to the project. Project emissions could be reduced by about 2% if bus service is eventually brought to the site,

- Bicycle amenities should be provided for the project. This would include secure bicycle parking for employees, bicycle racks for customers, and bike lane connections. This vehicle trip reduction measure could reduce emissions by 2%.
- Pedestrian facilities should link future transit stops and access roadways to the major sites uses. This may reduce emissions by 1%.
- Designate a portion of the parking lot for weekday Park-and-Ride parking spaces which would reduce emissions from traffic in general.
- Project site employers would be required to post transit rates and scheduling information on bulletin boards, which may reduce emissions by 1%.

Mitigation measures to reduce traffic congestion in the area could result in lower emissions from vehicle travel. The amount of congestion relief is unknown, since the project would only contribute funds that would eventually provide improvements. No reduction could be estimated unless improvements were in place when the project becomes operational.

The impact would remain significant and unavoidable, even with full effectiveness of the mitigation measure.

CUMULATIVE IMPACTS

Cumulative air quality impacts are evaluated based on both a quantification of the Project-related air quality impacts and the consistency of the Project with local and regional air quality plans (i.e., the *Morgan Hill General Plan* and the 2000 Bay Area Clean Air Plan). At the local level, future cumulative traffic conditions would not result in any violation of the carbon monoxide standard. As a result, there would not be a cumulative impact to local air quality. Emissions associated with traffic generated by the proposed shopping center are predicted to be above the significant thresholds established by the Bay Area Air Quality Management District, and therefore, would result in a cumulatively considerable net increase of any criteria pollutant for which the region is nonattainment under an applicable federal or state ambient air quality standard.

The Bay Area Air Quality Management District (BAAQMD) is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the San Francisco Bay Area Air Basin. The BAAQMD, with assistance from the Association of Bay Area Governments and the Metropolitan Transportation Commission has prepared and implements specific plans to meet the applicable laws, regulations, and programs. Among them are the *Carbon Monoxide Maintenance Plan* (1994), *Bay Area Clean Air Plan* (2000), and the 2001 Ozone Attainment Plan (currently under review for approval by EPA). The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, the BAAQMD relies on planned land uses established by local general plans. When a project proposes to change planned uses, by requesting a general plan amendment, the project may depart from the assumptions used to formulate BAAQMD in such a way that the cumulative result of incremental changes may hamper or prevent the BAAQMD from achieving its goals. This is because land use patterns influence transportation needs, and motor vehicles are the primary source of air pollution.

The proposed project would include a general plan amendment (GPA) for the relocation of a future collector street extending from Mission View Drive north of Cochrane Road instead of extending from St. Louise Drive as designated on the *City of Morgan Hill General Plan* map. This amendment is not likely to interfere with population projections or change vehicle miles traveled in Morgan Hill. The project is proposing a retail center that would serve the needs of the population. It is unlikely to interfere with region-wide population or vehicle miles traveled projections that are used in Clean Air planning efforts.

The proposed project would not interfere with regional air quality planning efforts. However, because the project results in significant emissions of air pollutants that affect regional air quality, it is considered to result in a significant cumulative air quality impact.

TABLE 1
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	NATIONAL STANDARDS ^(a)	
			Primary ^(b,c)	Secondary ^(b,d)
Ozone	8-hour	—	0.08 ppm (176 µg/m ³)	—
	1-hour	0.09 ppm (180 µg/m ³)	0.12 ppm (235 µg/m ³)	Same as primary
Carbon monoxide	8-hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	—
	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	—
Nitrogen dioxide	Annual	—	0.053 ppm (100 µg/m ³)	Same as primary
	1-hour	0.25 ppm (470 µg/m ³)	—	—
Sulfur dioxide	Annual	—	0.03 ppm (80 µg/m ³)	—
	24-hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m ³)
	1-hour	0.25 ppm (655 µg/m ³)	—	—
PM ₁₀	Annual	30 µg/m ³ (geometric mean)	50 µg/m ³ (arithmetic mean)	Same as primary
	24-hour	50 µg/m ³	150 µg/m ³	Same as primary
PM _{2.5}	Annual	12 µg/m ³	15 µg/m ³	
	24-hour	—	65 µg/m ³	
Lead	Calendar quarter	—	1.5 µg/m ³	Same as primary
	30-day average	1.5 µg/m ³	—	—

Notes: (a) Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.

(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

TABLE 2
HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS

Pollutant	Average Time	MEASURED AIR POLLUTANT LEVELS				
		2000	2001	2002	2003	2004*
San Martin						
Ozone (O ₃)	1-Hour	0.11 ppm	0.12 ppm	0.12 ppm	0.11 ppm	0.09 ppm
	8-Hour	0.10 ppm	0.09 ppm	0.10 ppm	0.09 ppm	0.08 ppm
Central San Jose						
Carbon Monoxide (CO)	8-Hour	6.3 ppm	5.1 ppm	4.5 ppm	4.0 ppm	2.9 ppm
Nitrogen Dioxide (NO ₂)	1-Hour	0.11 ppm	0.11 ppm	0.08 ppm	0.09 ppm	0.07 ppm
	Annual	0.025ppm	0.024ppm	NA	0.021ppm	NA
San Jose – Tully Road						
Fine Particulate Matter (PM _{2.5})	1-Hour	69 ug/m ³	75 ug/m ³	70 ug/m ³	58 ug/m ³	NA
	Annual	21 ug/m ³	23 ug/m ³	NA	25 ug/m ³	NA
Respirable Particulate Matter (PM ₁₀)	24-Hour	NA	NA	58 ug/m ³	52 ug/m ³	NA
	Annual	NA	NA	NA	10 ug/m ³	NA
Bay Area (Basin Summary)						
Ozone (O ₃)	1-Hour	0.15 ppm	0.13 ppm	0.16 ppm	0.13 ppm	NA
	8-Hour	0.11 ppm	0.10 ppm	0.11 ppm	0.10 ppm	NA
Carbon Monoxide (CO)	8-Hour	6.3 ppm	5.1 ppm	4.5 ppm	4.0 ppm	NA
Nitrogen Dioxide (NO ₂)	1-Hour	0.11 ppm	0.11 ppm	0.08 ppm	0.09 ppm	NA
	Annual	0.025ppm	0.024ppm	0.014ppm	0.021ppm	NA
Fine Particulate Matter (PM _{2.5})	1-Hour	NA	NA	77 ug/m ³	56 ug/m ³	NA
	Annual	NA	NA	14 ug/m ³	11.7 ug/m ³	NA
Respirable Particulate Matter (PM ₁₀)	24-Hour	76 ug/m ³	109 ug/m ³	84 ug/m ³	60 ug/m ³	NA
	Annual	24 ug/m ³	26 ug/m ³	25 ug/m ³	25 ug/m ³	NA

* Partial data set for some pollutants

Source: California Air Resources Board 2004.

Note: ppm = parts per million

Values reported in bold exceed ambient air quality standard

NA = data not available.

TABLE 3
SUMMARY OF MEASURED AIR QUALITY EXCEEDANCES

Pollutant	Standard	Monitoring Station	Days Exceeding Standard				
			2000	2001	2002	2003	2004
Ozone (O ₃)	NAAQS 1-hr	San Martin BAY AREA	0 3	0 1	0 2	0 1	0 --
	NAAQS 8-hr	San Martin BAY AREA	1 4	2 7	5 7	4 7	0 --
	CAAQS 1-hr	San Martin BAY AREA	4 12	7 15	8 16	2 19	2 --
Fine Particulate Matter (PM ₁₀)	NAAQS 24-hr	San Jose BAY AREA	0 0	0 0	0 0	0 0	0 0
	CAAQS 24-hr	San Jose BAY AREA	2 7	4 10	2 6	2 6	0 --
Fine Particulate Matter (PM _{2.5})	NAAQS 24-hr	San Jose BAY AREA	NA 1	NA 5	NA 7	0 0	0 --
All Other (CO, NO ₂ , Lead, SO ₂)	All Other	San Jose (Tully) BAY AREA	0 0	0 0	0 0	0 0	0 0

TABLE 4
PREDICTED 8-HOUR WORST CASE CARBON MONOXIDE LEVELS (in PPM)

Description	2005 Existing	Project Conditions ~2007	Cumulative with Project ~2010	General Plan Buildout 2025
Cochrane Rd and US 101 Northbound	5.7 ppm	6.8 ppm*	6.0 ppm*	4.2 ppm
Cochrane Rd and US 101 Southbound	6.8 ppm	7.4 ppm*	6.4 ppm*	4.3 ppm
Cochrane Rd and Butterfield Blvd.	5.1 ppm	5.6 ppm*	5.1 ppm*	4.2 ppm
<i>Significance Thresholds (CAAQS)</i>	<i>9.0 ppm for 8-hour exposure</i>			

TABLE 5
DAILY REGIONAL AIR POLLUTANT EMISSIONS (POUNDS PER DAY)

Description	Reactive Organic Gases	Nitrogen Oxides	Particulate Matter (PM ₁₀)
Weekday Emissions	149*	135	110
Weekend Emissions	189*	177	146
<i>BAAQMD Significance Thresholds</i>	<i>80 lbs</i>	<i>80 lbs</i>	<i>80 lbs</i>

Includes estimated 19 pounds per day of Reactive Organic Gas emissions associated with possible gas station

ATTACHMENT

CO ANALYSIS PROCEDURE FOR TRAFFIC INCREASES

Traffic : From traffic report. Only weekday PM traffic was used, since highest CO concentrations occur during the early morning or evening. While weekends may generate the greatest traffic, that traffic would occur during the midday when meteorological conditions are less conducive to high CO concentrations.

Emission Factors :

Modeled using EMFAC2002 for Santa Clara County

Used worst-case speed 5 mph for all links, which results in high emission rates

EMFAC2002 rates for 2005 used to model existing; rates for 2007 for project conditions, and 2010 used for cumulative with project.

Emission Factor (EMFAC2002):

14.05 gram/mile for 2004 (LOS F – 5mph)

8.01 gram/mile for 2010 (LOS F - 5 mph)

3.02 gram/mile for 2020 (LOS F - 5 mph)

Reference CO Concentration at *edge* of roadway (worst case):

11.9 for Primary at grade 4-lane road

3.3 for Secondary at grade 4-lane Road

Background 8-hour CO concentration: 3.5 ppm

Screening Method & Assumptions

Use BAAQMD CO Hot Spots Manual calculation method to estimate roadside CO concentrations. The 1-hr average CO concentration is estimated using BAAQMD CEQA Guidelines Table 12 values. The BAAQMD max. 1-hr CO values are based on worst-case met conditions and converted to an 8-hour average. The screening calculations that compute the max 1-hour CO concentration contribution from each roadway (in ppm) is based on the following equation:

$$Ci = (Cri \times Vi \times Efi) / 100,000$$

Where,

Cri = CO reference conc. in ppm

Vi = hourly traffic volume

Efi = CO emission factor in g/VMT

This yields a 1-hour CO concentration based on worst-case meteorology that is then converted to a 8-hour concentration using a persistence factor of 0.7 (recommended by BAAQMD) and then added to the existing background 8-hour concentration (3.5 ppm). The resulting concentration is then compared to NAAQS and CAAQS. *Calculations attached.*

Regional Emissions Calculations

Regional emissions were calculated using the URBEMIS 2002 model (version 7.5) obtained from the California Air Resources Board website: <http://www.arb.ca.gov/html/soft.htm>

URBEMIS 2002 is a computer program that can be used to estimate emissions associated with land development projects in California such as residential neighborhoods, shopping centers, and office buildings. The model calculates emissions from traffic generation, area sources (such as gas appliances, wood stoves, fireplaces, and landscape maintenance equipment) and construction projects. The model includes land use types for different types of retail use. Inputs to the model are as follows:

Project Type Size:	Regional shopping center
Trip Rate:	Adjusted for project traffic projections
Project Year:	2007
Season:	Summer
Temperature:	85°F

All other inputs were default inputs used for analysis conducted in the San Francisco Bay Area Air Basin. Emissions were predicted for area sources and operational motor vehicle sources.

Area Source Emissions

The model predicts area source emissions from the different land uses. These include emissions from natural gas usage and landscape equipment.

Traffic Emissions

The model predicts vehicle trips and associated vehicle miles traveled based on the land use types. The trip generation from these land use types is adjusted for project-specific forecasts.

Gasoline fueling stations

Potential gasoline fueling emissions were calculated for the project. The California Air Pollution Control Officers Association (CAPCOA) reports emission rates of 1.27 pounds of ROG per 1,000 gallons of fuel dispense assuming required controls. Predicted throughput for the gasoline dispensing is not available for this project. A review of 2004 and 2005 air quality permits issued by the BAAQMD indicates a range of throughput values between 2 and 10 million gallons per year with most below 5 million gallons per year. An annual throughput of 5 million gallons per year or 15 thousand gallons per day was used to calculate daily emissions.

$$15,000 \text{ gal. fuel dispensed} * 1.27 \text{ pounds ROG} / 1,000 \text{ gal. Fuel dispensed} = 19 \text{ pounds ROG per day}$$

Source: *Gasoline Service Station Industry Wide Risk Assessment Guidelines*, CAPCOA, Nov. 1997 <http://www.arb.ca.gov/ab2588/rrap-iwra/gasiwra.pdf>

URBEMIS2002 Model Output Attached.
CO Screening analysis attached

URBEMIS 2002 For Windows 7.5.0

File Name: <Not Saved>
 Project Name: Cochrane Rd. PUD weekday
 Project Location: San Francisco Bay Area
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.54	6.36	3.13	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	129.41	128.58	1,291.12	0.73	110.09
TOTALS (lbs/day, mitigated)	129.41	128.58	1,291.12	0.73	110.09

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	129.96	134.94	1,294.24	0.73	110.10

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

URBEMIS 2002 For Windows 7.5.0

File Name: <Not Saved>
Project Name: Cochrane Rd. PUD weekday
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.46	6.35	2.54	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.54	6.36	3.13	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Regnl shop. center	129.41	128.58	1,291.12	0.73	110.09
TOTAL EMISSIONS (lbs/day)	129.41	128.58	1,291.12	0.73	110.09

Includes correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2007 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Regnl shop. center	33.49 trips / 1000 sq. ft.	657.25	22,011.30

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.20	1.80	97.80	0.40
Light Truck < 3,750 lbs	15.10	3.30	94.00	2.70
Light Truck 3,751- 5,750	16.10	1.90	96.90	1.20
Med Truck 5,751- 8,500	7.10	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.70	82.40	17.60	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	4.6	6.1	11.8	5.0	5.0
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip Speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	27.3	21.2	51.5			

% of Trips - Commercial (by land use)

Regnl shop. center	2.0	1.0	97.0
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

Changes made to the default values for Operations

The operational emission year changed from 2004 to 2007.

URBEMIS 2002 For Windows 7.5.0

File Name: <Not Saved>
 Project Name: Cochrane WEEKEND 2007
 Project Location: San Francisco Bay Area
 On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
 (Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day, unmitigated)	0.54	6.36	3.13	0.00	0.01

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day, unmitigated)	169.21	170.93	1,716.35	0.97	146.35
TOTALS (lbs/day, mitigated)	169.21	170.93	1,716.35	0.97	146.35

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day, unmitigated)	169.76	177.29	1,719.47	0.97	146.36

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

URBEMIS 2002 For Windows 7.5.0

File Name: <Not Saved>
Project Name: Cochrane WEEKEND 2007
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)					
Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.46	6.35	2.54	-	0.01
Wood Stoves - No summer emissions					
Fireplaces - No summer emissions					
Landscaping	0.08	0.01	0.58	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
TOTALS (lbs/day, unmitigated)	0.54	6.36	3.13	0.00	0.01

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Regnl shop. center	169.21	170.93	1,716.35	0.97	146.35
TOTAL EMISSIONS (lbs/day)	169.21	170.93	1,716.35	0.97	146.35

Includes correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2007 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
Regnl shop. center	44.52 trips / 1000 sq. ft.	657.25	29,260.77

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	55.20	1.80	97.80	0.40
Light Truck < 3,750 lbs	15.10	3.30	94.00	2.70
Light Truck 3,751- 5,750	16.10	1.90	96.90	1.20
Med Truck 5,751- 8,500	7.10	1.40	95.80	2.80
Lite-Heavy 8,501-10,000	1.10	0.00	81.80	18.20
Lite-Heavy 10,001-14,000	0.40	0.00	50.00	50.00
Med-Heavy 14,001-33,000	1.00	0.00	20.00	80.00
Heavy-Heavy 33,001-60,000	0.90	0.00	11.10	88.90
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.70	82.40	17.60	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	1.20	8.30	83.30	8.40

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	4.6	6.1	11.8	5.0	5.0
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip Speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	27.3	21.2	51.5			

% of Trips - Commercial (by land use)

Regnl shop. center	2.0	1.0	97.0
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Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Area

Changes made to the default values for Operations

The operational emission year changed from 2004 to 2007.

COCHRANE ROAD PUD, MORGAN HILL

CARBON MONOXIDE ANALYSIS

PM Peak Hour
Assumes worst case of all intersections based on total volume, LOS and project traffic contribution

Intersection	Traffic Volume				1-Hour CO Contribution				Total 1-Hour CO Concentration				Total 8-Hour CO Concentration			
	Exist	Project	Cumulative + Project	General Plan 2025	Exist	Project	Cumulative + Project	General Plan 2025	Exist	Project	Cumulative + Project	General Plan 2025	Exist	Project	Cumulative + Project	General Plan 2025
Link: Cochrane Rd/US 101 Northbound (#6)									9.2	10.7	9.6	7.1	5.7	6.8	6.0	4.2
Cochrane Rd (4 lanes)	1701	3120	3278	3690	2.5	4.0	3.1	0.9								
US 101 NB (2 lanes)	1336	1846	1893	1775	0.6	0.7	0.6	0.1								
Cochrane Rd/US 101 Southbound (#5)									10.8	11.5	10.2	7.1	6.8	7.4	6.4	4.3
Cochrane Rd (4 lanes)	2902	3784	3895	4090	4.3	4.9	3.7	1.0								
US 101 SB (2 lanes)	897	1639	1715	1620	0.4	0.7	0.5	0.1								
Cochrane Rd/Butterfield (#5)									8.3	9.0	8.3	7.0	5.1	5.6	5.1	4.2
Cochrane Rd (4 lanes)	1345	2052	2148	2930	2.0	2.6	2.0	0.7								
Butterfield (4 lanes)	637	972	979	3500	0.3	0.3	0.3	0.2								

* Indicates primary roadway (due to higher volume)

Emission Factors (EMFAC2002 - 5mph)			
Santa Clara County			
LOS E or F (5mph)	2005	=	12.6 g/mi
	2007	=	10.8 g/mi
	2010		7.9 g/mi
	2025		2.1 g/mi

Background CO Levels - Morgan Hill (BAAQMD)			
	1-Hour	8-Hour	
	6	3.5	

Dispersion Factors	
Primary	Edge
2 Ln	14.0
4 Ln	11.9
6 Ln	9.5
Secondary	
2 Ln	3.7
4 Ln	3.3
6 Ln	2.8